PLANETARY PHENOMENA FOR MARCH AND APRIL, 1921

By Malcolm McNeill

PHASES OF THE MOON, PACIFIC TIME

Last Quarter	March	1,	$6^h\ 3^m$	A.M.	New Moon	April 8,	$1^h\ 5^m$ A.M.
New Moon	"	9,	10 9	A.M.	First Quarter	" 15,	2 12 A.M.
First Quarter	"	16,	7 49	P.M.	Full Moon	" 21,	11 49 P.M.
Full Moon	"	23,	12 19	P.M.	Last Quarter	" 29,	8 9 P.M.
Last Quarter	"	31,	1 13	A.M.			

The first of the four *eclipses* of the year will be an *Annular Eclipse of the Sun* on April 7. It will not be visible from any part of the United States. The annulus starts in the middle of the Atlantic about the latitude of Newfoundland, runs north and east just touching the northern part of Scotland and Norway, and ends near the North Pole. It will be seen as a partial eclipse in the early morning in New Foundland and Labrador, and later in the day in Northern Africa, all of Europe, and northwestern Asia.

The second eclipse of the year will be a *Total Eclipse of the Moon* on April 21-22, the beginning visible generally in North America, South America, the Atlantic Ocean, and the Pacific Ocean; the ending visible generally in North America, South America, Australia, the Pacific Ocean, and eastern Asia. As the Moon passes thru the cone of the Earth's shadow where the chord is only a little larger than the Moon, the duration of totality is small. The elements of the eclipse are as follows, Pacific Time:

Moon enters penumbra	April 21,	8^h57^m	P.M.
Moon enters umbra	" "	10 3	P.M.
Total eclipse begins	" "	11 23	P.M.
Middle of eclipse	" "	11 44	P.M.
Total eclipse ends	" 22,	12 5	A.M.
Moon leaves umbra	" 22,	1 26	A.M.
Moon leaves penumbra	" 22,	2 32	A.M.

The Sun passes the Vernal Equinox and Spring begins on March 20, 7^h51^mP.M., Pacific Time.

Mercury is not in good position for observation during March and April. It comes to inferior conjunction with the Sun on March 2, changing from an evening to a morning star, and will remain a morning star until May 10. It reaches greatest west elongation, 27°50′, on March 30, but as it is at that time more than 12° south of the Sun it will rise less than an hour earlier, and can scarcely be seen in the morning twilight. For regions of the Earth south of the equator the conditions of visibility are very good, as the greater southern declination of the planet makes for a greater

interval between the rising of *Mercury* and sunrise. The greatest elongation, 27°50′, is near the maximum possible, as aphelion is reached only about one day later.

Venus remains an evening star to April 22 when it passes inferior conjunction with the Sun and becomes a morning star. On March 1 it does not set until nearly four hours after sunset, about two and one half hours later on April 1, and the interval does not become as small as one hour until after the middle of the month. At the time of conjunction *Venus* is about 7° north of the Sun, and for a day or two it is both an evening and a morning object. It is just barely possible that this may be visible to naked eye view on account of the great brightness of the planet. The time of greatest brightness occurs on March 16. It will then be visible to the naked eye in full daylight. This condition will last for a week or two after the time of greatest brightness.

Mars remains an evening star but the Sun is slowly overtaking it in their common eastward motion. On March 1 the planet sets about two and a half hours after sunset and at the end of April not quite an hour and a half. The interval is sufficient for naked eye view of the planet in evening twilight, altho the brightness of the planet is not very much greater than that of the pole star.

Jupiter is getting into fine position for evening observation. On March 1 it rises a few minutes after sunset, and during the two months' period rises a little more than four minutes earlier each night so that it is soon high enough to be seen in the east in the evening twilight. By the end of February it reaches the meridian shortly after 8 P. M. It comes to opposition with the Sun on March 4 and is then above the horizon the entire night. During the two months it is in the constellation *Leo* and moves westward 5° and northward 2° toward *Regulus*, (*α Leonis*), being about 10° east of that star on February 28.

Saturn is in the same neighborhood as *Jupiter* following about half an hour after. Like *Jupiter* its motion is westward but at a slightly smaller rate and the apparent distance between the bodies increases slightly so that their distance apart is a little more than 9° on February 28. It comes to opposition with the Sun on March 12 and is then above the horizon all night. The rings are practically out of sight until late in the year. Up to the end of February the Sun shines on the face of the rings turned away from the Earth. Then the Earth passes thru the plane of the rings bringing Sun

and Earth on the same side. In early April the plane of the rings crosses the Sun, so that Sun and Earth are again on opposite faces of the rings. This condition lasts until early August when the Earth crosses the plane once more, and Sun and Earth are again on the same side, their ordinary position.

Uranus passed conjunction with the Sun on February 24 and became a morning star, but remains too near the Sun for easy observation.

Neptune remains in the constellation *Cancer*, too faint for naked eye observation.